

EXPRESS MAIL NO. EL029404315US

PATENT

Attorney Docket No. 01-4006

**WHAT IS CLAIMED:**

1. An apparatus for logging events that occur during a call to a call center, said apparatus comprising:  
an analysis unit adapted to analyze a recording of a complete call to the call center; and

a memory unit adapted to automatically record, in an event log, information about events that occurred during an interaction between the caller and an interactive voice response (IVR) program of an IVR system of the call center, wherein

said analysis unit is programmed with the IVR program's call flow, such that all possible paths the caller may take while interacting with the IVR program are known by said analysis unit,

the event log includes data on at least one of:

a prompt made by the IVR system to the caller,  
a touch-tone entry made by the caller in response to the prompt,

a verbal answer spoken by the caller in response to the prompt,

a period of silence,  
termination of the call by the caller, and  
transfer of the call to a live agent, and  
the event log logs events in sequential order.

2. An apparatus according to Claim 1,  
wherein said analysis unit includes a decoder for decoding the caller's responses to prompts, and  
wherein said analysis unit identifies states and transitions of the call, with a state corresponding to a transaction between the IVR program and an entity other than the IVR system, and a transition corresponding to the call

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remaining at a current state or moving from one state to another state as a result of a transaction.

3. An apparatus according to Claim 2, wherein the decoder is a dual-tone multi-frequency (DTMF) decoder.

4. An apparatus according to Claim 2, wherein the decoder is a speech recognition unit.

5. An apparatus according to Claim 1, wherein said memory unit is adapted to record time data, including a time of day when the call occurred, how long it takes for the caller to respond to a prompt, and how long it takes for a transition from one state to another state.

6. An apparatus according to Claim 1, wherein said memory unit is adapted to record a telephone number identifying the caller.

7. An apparatus according to Claim 1, wherein the event log includes data on:

whether the caller received information from the IVR system,

a number of times a state was traversed during the call,

whether and where, in the IVR program, the caller made a request for a live agent,

whether a transfer to a live agent occurred successfully,

where, in the IVR program, the caller terminated the call.

8. A method for logging events that occur during a call to a call center, said method comprising:

an analysis step of analyzing a recording of a complete call to the call center; and

a storage step of automatically storing, in an event log, information about events that occurred during an interaction between the caller and an interactive voice response (IVR) program of an IVR system of the call center, wherein

said analysis step performs an analysis based on the IVR program's call flow, such that all possible paths the caller may take while interacting with the IVR program are taken into consideration in said analysis step,

the event log includes data on at least one of:

a prompt made by the IVR system to the caller,

a touch-tone entry made by the caller in response to the prompt,

a verbal answer spoken by the caller in response to the prompt,

a period of silence,

termination of the call by the caller, and

transfer of the call to a live agent, and

the event log logs events in sequential order.

9. A method according to Claim 8, wherein said analysis step includes:

decoding the caller's responses to prompts, and

identifying states and transitions of the call,

with a state corresponding to a transaction between the IVR program and an entity other than the IVR system, and a transition corresponding to the call remaining at a current

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state or moving from one state to another state as a result of a transaction.

10. A method according to Claim 9, wherein the decoding is performed using a dual-tone multi-frequency (DTMF) decoder.

11. A method according to Claim 9, wherein the decoding is performed using a speech recognition unit.

12. A method according to Claim 8, wherein said storage step records time data, including a time of day when the call occurred, how long it takes for the caller to respond to a prompt, and how long it takes for a transition from one state to another state.

13. A method according to Claim 8, wherein said storage step records a telephone number identifying the caller.

14. A method according to Claim 8, wherein the event log includes data on:

- whether the caller received information from the IVR system,
- a number of times a state was traversed during the call,
- whether and where, in the IVR program, the caller made a request for a live agent,
- whether a transfer to a live agent occurred successfully,
- where, in the IVR program, the caller terminated the call.

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15. A method according to Claim 8, further comprising:

a truth step of determining a true purpose of the call, based on recorded interactions between the caller and a live agent in the recording of the complete call; and

a comparison step of comparing the true purpose of the call with the analysis performed in said analysis step to determine whether it would be possible to satisfy the true purpose of the call through the IVR program.

16. A method according to Claim 15, further comprising a troubleshooting step of, locating portions of the IVR program that caused the caller to enter an erroneous response to a prompt, if it is determined in said comparison step that it would be possible to satisfy the true purpose of the call through the IVR program.

17. A method according to Claim 16, further comprising an error reporting step of generating an error report summarizing errors made by callers to the call center that prevent them from true purposes of their calls.

18. A computer program product embodying a computer program for implementing method for logging events that occur during a call to a call center, the program comprising:

code for an analysis step of analyzing a recording of a complete call to the call center; and

code for a storage step of automatically storing, in an event log, information about events that occurred during an interaction between the caller and an interactive voice response (IVR) program of an IVR system of the call center, wherein

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the analysis step performs an analysis based on the IVR program's call flow, such that all possible paths the caller may take while interacting with the IVR program are taken into consideration in the analysis step,

the event log includes data on at least one of:

a prompt made by the IVR system to the caller,

a touch-tone entry made by the caller in response to the prompt,

a verbal answer spoken by the caller in response to the prompt,

a period of silence,

termination of the call by the caller, and

transfer of the call to a live agent, and

the event log logs events in sequential order.

19. A computer program product according to Claim 18, wherein the analysis step includes:

decoding the caller's responses to prompts, and

identifying states and transitions of the call,

with a state corresponding to a transaction between the IVR program and an entity other than the IVR system, and a transition corresponding to the call remaining at a current state or moving from one state to another state as a result of a transaction.

20. A computer program product according to Claim 19, wherein the decoding is performed using a dual-tone multi-frequency (DTMF) decoder.

21. A computer program product according to Claim 19, wherein the decoding is performed using a speech recognition unit.

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22. A computer program product according to Claim 18, wherein the storage step records time data, including a time of day when the call occurred, how long it takes for the caller to respond to a prompt, and how long it takes for a transition from one state to another state.

23. A computer program product according to Claim 18, wherein the storage step records a telephone number identifying the caller.

24. A computer program product according to Claim 18, wherein the event log includes data on:

whether the caller received information from the IVR system,

a number of times a state was traversed during the call,

whether and where, in the IVR program, the caller made a request for a live agent,

whether a transfer to a live agent occurred successfully,

where, in the IVR program, the caller terminated the call.

25. A computer program product according to Claim 18, wherein the program further comprises:

code for a truth step of determining a true purpose of the call, based on recorded interactions between the caller and a live agent in the recording of the complete call; and

code for a comparison step of comparing the true purpose of the call with the analysis performed in said analysis step to determine whether it would be possible to satisfy the true purpose of the call through the IVR program.

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26. A computer program product according to Claim 25, wherein the program further comprises a troubleshooting step of locating portions of the IVR program that caused the caller to enter an erroneous response to a prompt, if is determined in the comparison step that it would be possible to satisfy the true purpose of the call through the IVR program.

27. A computer program product according to Claim 16, further comprising an error reporting step of generating an error report summarizing errors made by callers to the call center that prevent them from satisfying true purposes of their calls.

28. An apparatus for logging events that occur during a contact to a contact center, said apparatus comprising:

an analysis unit adapted to analyze a recording of a complete contact to the contact center; and

a memory unit adapted to automatically record, in an event log, information about events that occurred during an interaction between a person who initiated the contact, or contactor, and an interactive response program of an automated response system of the contact center, wherein

said analysis unit is programmed with the interactive response program's contact flow, such that all possible paths the contactor may take while interacting with the interactive response program are known by said analysis unit,

the event log includes data on at least one of:

a prompt made by the automated response system to the contactor,



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an entry made by the contactor in response to the prompt,

a verbal answer spoken by the contactor in response to the prompt,

a period of silence,

termination of the contact by the contactor,

and

transfer of the contact to a live agent, and the event log logs events in sequential order.

29. A method for logging events that occur during a contact to a contact center, said method comprising:

an analysis step of analyzing a recording of a complete contact to the contact center; and

a storage step of automatically storing, in an event log, information about events that occurred during an interaction between a person initiating the contact, or contactor, and an interactive response program of an automated response system of the contact center, wherein

said analysis step performs an analysis based on the interactive response program's contact flow, such that all possible paths the contactor may take while interacting with the interactive response program are taken into consideration in said analysis step,

the event log includes data on at least one of:

a prompt made by the automated response system to the contactor,

an entry made by the contactor in response to the prompt,

a verbal answer spoken by the contactor in response to the prompt,

a period of silence,

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termination of the contact by the contactor,  
and

transfer of the contact to a live agent, and  
the event log logs events in sequential order.

30. A computer program product embodying a computer program for implementing method for logging events that occur during a contact to a contact center, the program comprising:

code for an analysis step of analyzing a recording of a complete contact to the contact center; and

code for a storage step of automatically storing, in an event log, information about events that occurred during an interaction between a person initiating the contact, or contactor, and an interactive response program of an automated response system of the contact center, wherein

the analysis step performs an analysis based on the interactive response program's contact flow, such that all possible paths the contactor may take while interacting with the interactive response program are taken into consideration in the analysis step,

the event log includes data on at least one of:

a prompt made by the automated response system to the contactor,

an entry made by the contactor in response to the prompt,

a verbal answer spoken by the contactor in response to the prompt,

a period of silence,

termination of the contact by the contactor,

and

transfer of the contact to a live agent, and  
the event log logs events in sequential order.